

EVOLUTION OF MILK COMPOSITION IN COW'S MILK DURING THE TIME COURSE OF MILKING



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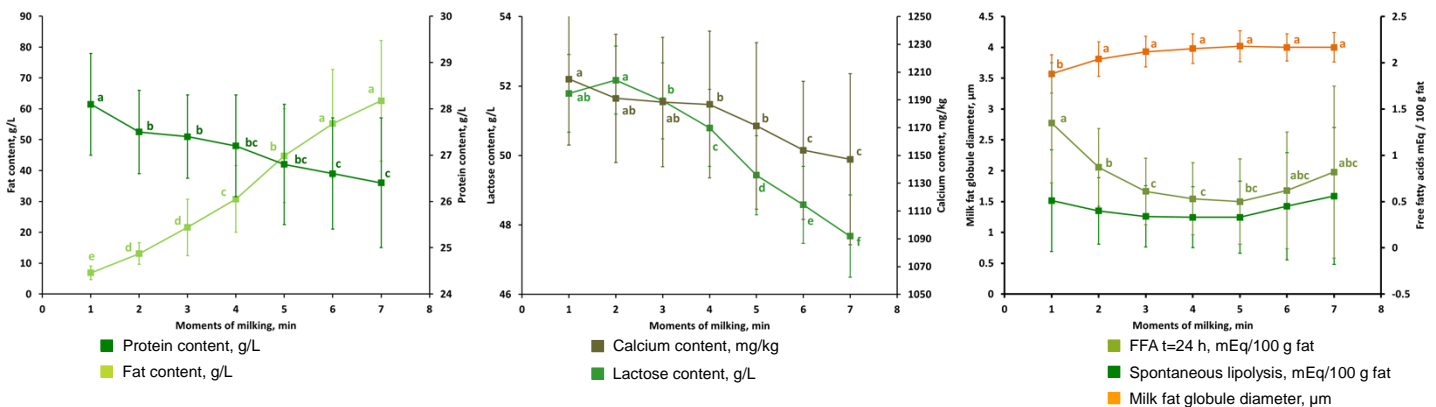
Variation factors of spontaneous lipolysis are not very well known yet. Changes in spontaneous lipolysis were investigated during lactation, but had not been the object of research during the time course of milking. The objective of this study was to analyze spontaneous lipolysis variations during milking, and to analyze the evolution of milk composition, on criteria that may be related to spontaneous lipolysis.

Material and methods

- 9 dairy cows averaging 56 ± 6 days in milk
- Diet based on maize silage, dehydrated alfalfa (76.7% DMI forage), cereals and soybean meal (20.8% DMI concentrate), minerals, and vitamins (2.5% DMI)
- Milk samplings every min during morning milking
- Measures :
 - Milk composition (fat, protein, lactose, calcium, fatty acids (FA))
 - Milk fat globule diameter (MFG)
 - Free fatty acids (FFA) (t=0 and t=24 h at 4°C), spontaneous lipolysis
- Results of 3 first and 3 last min kept. Interim results averaged. Evolution in 7 points.
- Statistical analysis carried out using Proc Mixed in SAS



Results



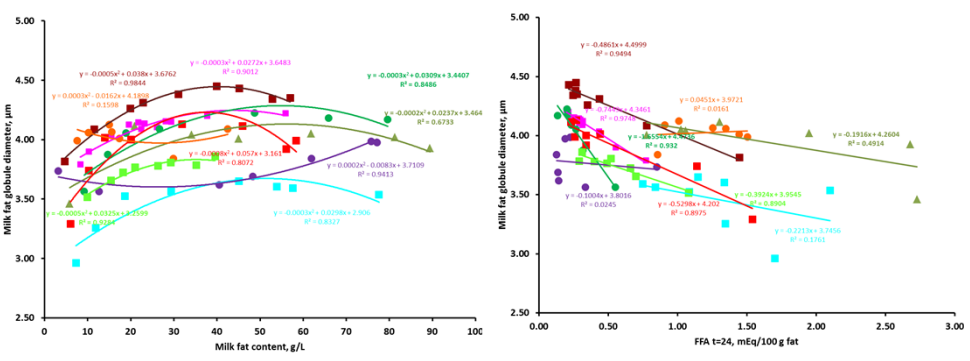
- Increase of fat content during milking
- Decrease of protein content
- Same results as in Ontsouka et al (2003)

- Parallel decrease of lactose and calcium contents

- No change in spontaneous lipolysis
- Curvilinear decrease of FFA t=24h
- Slight increase of MFG diameter

FA, %	Times							P
	1	2	3	4	5	6	7	
C16:0	34.4 ^{ab}	32.5 ^c	32.8 ^c	33.7 ^b	34.8 ^a	35.3 ^a	35.8 ^a	**
c9 18:1	18.1 ^{bc}	18.8 ^a	18.6 ^{ab}	18.3 ^{ab}	17.6 ^c	17.8 ^c	17.6 ^c	**
C18:3	0.42 ^c	0.45 ^a	0.44 ^a	0.42 ^{ab}	0.39 ^c	0.38 ^c	0.38 ^{bc}	**
C9t11 CLA	0.44 ^{bc}	0.55 ^a	0.53 ^{ab}	0.50 ^{ab}	0.48 ^{ab}	0.46 ^b	0.48 ^{ab}	**

- Large decrease of the ratio c9C18:1/C16:0 during milking
- Decrease of C18:3 n-3 and increase of C22:5 n-3
- Link with MFG diameter ?



- Intra-animal, strong relationship between MFG diameter and milk fat content and FFA t=24 h (a different color for each cow).

In conclusion, there was a great change in milk composition during milking and a complete milking is necessary to obtain a representative picture of the secreted milk. Lipolysis did not change significantly during the time course of milking. Intra-cow, free fatty acids 24 h seemed to be linked to milk fat globule diameter. Spontaneous lipolysis in evening milking should be investigated.

